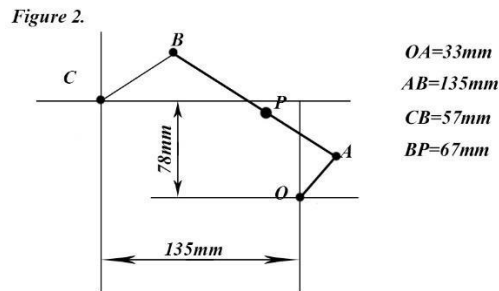
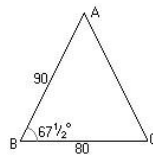


A : PLANE GEOMETRY

1. Figure 2 shows a link mechanism in which the crank OA rotates clockwise about 'O' at a constant speed. The link AB is attached to the rod CB which swings about C. 'P' is a point on the link AB. Plot the locus of 'P' for one revolution of A (25 marks)

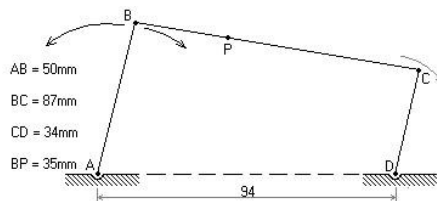


2. (a) Draw the triangle shown in the figure below without using a protractor and convert it to another triangle of equal area but with a height of 50mm.

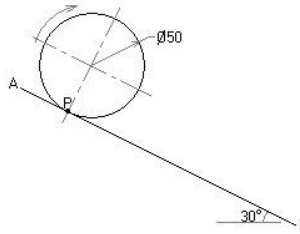


- (b) (i) Construct an isosceles triangle PQR with base PQ = 130mm and height 80mm.  
 (ii) Transform the triangle in b(i) into a rectangle of equal area with one side 50mm and state the length of the other side.

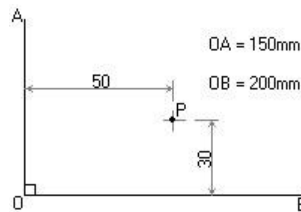
3. The figure below shows a mechanism in which crank AB swings about A while CD rotates clockwise about D.  
 (a) Draw, full size, the mechanism and plot the locus of point P on the link BC.  
 (b) Measure and state the maximum angle of oscillation of AB.



4. (a) A parabolic arch is 80mm wide and 80mm high. Draw the arch and determine its focal point.
- (b) The figure below shows a circular disc which rolls along surface AB without slipping. Draw the locus of point P on the rim of the disc for one complete revolution along AB.

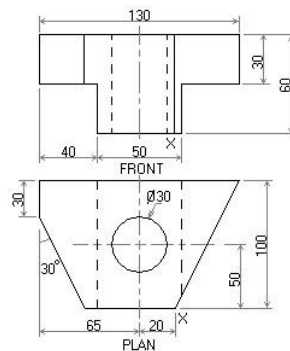


4. The figure below shows the asymptotes of a hyperbola. If P is a point on the curve, construct the hyperbola.

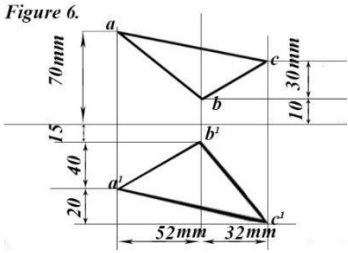


**SECTION B : SOLID GEOMETRY**

5. Two orthographic views of a machined block drawn in first angle projection are shown in the figure below. Draw full size an isometric view of the block making corner X the lowest point.



7. Figure 6 shows the projection of a triangle drawn in 1<sup>st</sup> angle projection



a) By rabatment method, draw the true shape of the triangle.

b) Draw and state the angle of inclination of the triangle

i) to the horizontal plane.      ii) to the vertical plane

8. Figure 5 shows a metal block drawn in 1<sup>st</sup> angle projection

